

PATENT APPLICATION

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of

Docket No: Q79896

Hirotooshi KAMATA, et al.

Appln. No.: 10/588,072

Group Art Unit: 1625

Confirmation No.: 2013

Examiner: Raymond K. COVINGTON

Filed: July 31, 2006

For: (METH)ACRYLOYL GROUP-CONTAINING OXETANE COMPOUND AND
PRODUCTION METHOD THEREOF

SUBMISSION OF APPEAL BRIEF

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

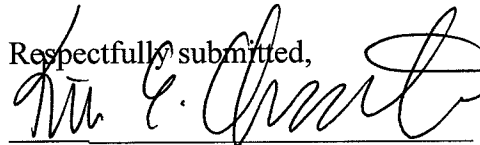
P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

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Respectfully submitted,



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WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: June 8, 2009

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

Table of Contents

I.	REAL PARTY IN INTEREST.....	2
II.	RELATED APPEALS AND INTERFERENCES	3
III.	STATUS OF CLAIMS	4
IV.	STATUS OF AMENDMENTS.....	5
V.	SUMMARY OF THE CLAIMED SUBJECT MATTER	6
VI.	GROUND OF REJECTION TO BE REVIEWED ON APPEAL	9
VII.	ARGUMENT.....	10
	CLAIMS APPENDIX	15
	EVIDENCE APPENDIX	19
	RELATED PROCEEDINGS APPENDIX.....	20

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
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I. REAL PARTY IN INTEREST

The real party in interest in this appeal is SHOWA DENKO K.K. having a business address of 13-9, Shiba Daimon 1-chome, Minato-ku, Tokyo 105-8518, Japan. The assignment from the inventors was previously recorded on July 31, 2006, at Reel 018158, Frame 0294.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
Attorney Docket No.: Q79896

II. RELATED APPEALS AND INTERFERENCES

To the knowledge and believe of Appellant, the Assignee, and the undersigned, there are no other appeals or interferences that will directly affect or be affected by the Board's decision in the instant Appeal.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
Attorney Docket No.: Q79896

III. STATUS OF CLAIMS

Claims 1-6 are all the claims pending in the application.

Claims 1-6 stand rejected.

Claims 1-6 are being appealed.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
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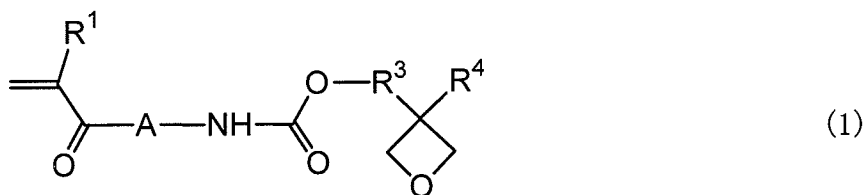
IV. STATUS OF AMENDMENTS

No amendment was filed subsequent to the final rejection of January 7, 2009.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

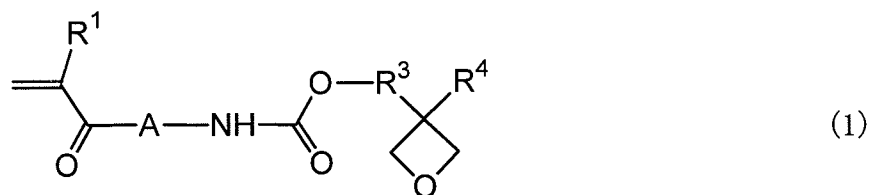
Independent claim 1 recites an oxetane compound containing:

a (meth)acryloyl group, which is represented by formula (1) below



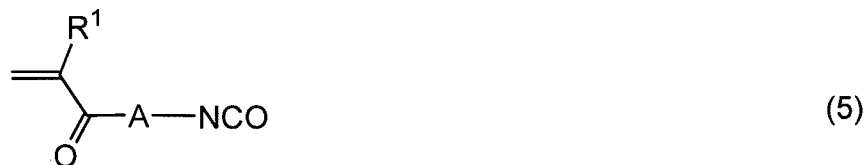
wherein R^1 represents a hydrogen atom or a methyl group, A represents $-\text{OR}^2-$ or a bond, R^2 represents a divalent hydrocarbon group which may contain an oxygen atom in the main chain, R^3 represents a linear or branched alkylene group having 1 to 6 carbon atoms, and R^4 represents a linear or branched alkyl group having 1 to 6 carbon atoms (see, e.g., the disclosure at page 3, lines 16-25, page 5, line 15 – page 7, line 8 in the present specification as filed).

Independent claim 5 recites a production method of a compound represented by formula (1) below



wherein R^1 represents a hydrogen atom or a methyl group, A represents $-OR^2-$ or a bond, R^2 represents a divalent hydrocarbon group which may contain an oxygen atom in the main chain, R^3 represents a linear or branched alkylene group having 1 to 6 carbon atoms, and R^4 represents a linear or branched alkyl group having 1 to 6 carbon atoms,

wherein an isocyanate compound containing a (meth)acryloyl group represented by formula (5) below is reacted with an oxetane compound containing a hydroxyl group represented by formula (6) below



wherein R^1 represents a hydrogen atom or a methyl group, A represents $-OR^2-$ or a bond, and R^2 represents a divalent hydrocarbon group which may contain an oxygen atom in the main chain,



wherein R^3 represents a linear or branched alkylene group having 1 to 6 carbon atoms, and R^4 represents a linear or branched alkyl group having 1 to 6 carbon atoms,

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
Attorney Docket No.: Q79896

where the molar ratio of the isocyanate to oxetane at the time of reaction is 1:0.90 to 1:1.10 (see, e.g., the disclosure at page 4, line 12 – page 5, line 9; page 7, line 9 – page 10, line 23, in the present specification as filed).

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
Attorney Docket No.: Q79896

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are as follows:

1. The rejection of claims 1-4 under 35 U.S.C. § 103(a) as being unpatentable over EP 0867443 to Moszner et al. in view of U.S. Patent No. 6,166,100 to Hiwara et al. and U.S. Patent No. 6,953,862 to Musa.
2. The rejection of claims 5-6 under 35 U.S.C. § 103(a) as being unpatentable over JP 11246541 to Mikito et al. (English abstract).

VII. ARGUMENT

1. The Rejection of Claims 1-4 under 35 U.S.C. § 103 over Moszner, Hiwara and Musa

On page 2 of the Office Action of January 7, 2009, claims 1-4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0867443 to Moszner et al. ("Moszner") in view of U.S. Patent No. 6,166,100 to Hiwara et al. ("Hiwara") and U.S. Patent No. 6,953,862 to Musa ("Musa").

In response, Appellant notes in summary the references do not anticipate or render obvious by any appropriate means, formula (1) of the present invention. Appellant submits that it is an error to reject the present compound by taking one portion of a compound from one reference and take a second portion of a compound from a second reference and claim the compound is obvious, as the Office has done here, where there is no support in either specification that the combination of the two portions would be desirable.

Appellant notes that the triethoxysilyl group disclosed in Moszner is different from the (meth)acryloyl group as presently claimed, and that given the structural differences in Moszner and Hiwara, one having ordinary skill in the art would not have been motivated to combine the references. Moreover, even if one having ordinary skill in the art combined the two references, the purpose of forming silicic acid condensates by hydrolytically condensing compounds of silicon and the like, as discussed in Moszner, would not be obtained. As such, the rejection is improper, as further discussed below.

Although an oxetane compound having both an oxetanyl group and a (meth)acryl group is improved in polymerizability, a problem remains in that, with its adhesiveness to other polymers or materials being poor, its practical properties are low. Accordingly, an object of the present invention is to provide a novel oxetane compound which has high practical properties, excellent in copolymerizability with compounds containing (meth)acryloyl groups. *See* disclosure at page 2, line 31 to page 3, line 7 in the present specification, as filed.

The oxetane compound of the present invention is a compound represented by formula (I), wherein a (meth)acryloyl group (which imparts copolymerizability), urethane bond (which imparts adhesiveness) and an oxetanyl group (imparting cationical polymerizability) are bonded in this order.

Hiwara discloses a compound having a structure wherein (meth)acryloyl group and oxetanylmethyl group are bound by an ester bond, which is different from a compound of the present invention in which a (meth)acryloyl group and an oxetanyl group are bound by a urethane group. *See* Hiwara at column 2, lines 1-65.

Meanwhile, Moszner discloses a compound wherein oxetanyl group is combined with triethoxysilyl group as a polymerizable group by a urethane group, however, the triethoxysilyl group taken as an example of a polymerizable group containing silicon aims at forming silicic acid condensates by hydrolytically condensing compounds of silicon and the like. Thus, the triethoxysilyl group disclosed in Moszner is different from the (meth)acryloyl

group as presently claimed, which aims at imparting copolymerizability by radical polymerization.

Furthermore, in the invention of Moszner, replacing a compound wherein oxetanylalkylurethane group is bound to triethoxysilyl group with a compound having a structure of Hiwara, where the (meth)acryloyl group is bound to the oxetanylmethyl group by an ester bond, would not achieve the purpose of forming silicic acid condensates by hydrolytically condensing compounds of silicon and the like, as disclosed in Moszner. Accordingly, one having ordinary skill in the art would not have been motivated to substitute the compound in Moszner with the structure of Hiwara, as suggested by the Office. In any event, even if the compound disclosed in Hiwara, wherein a (meth)acryloyl group is bound to the oxetanylmethyl group by an ester bond, was substituted into the compound disclosed in Moszner, it would not obtain the compound as presently claimed.

Thus, one having ordinary skill in the art would not be motivated to combine Moszner and Hiwara, nor would one have arrived at the present invention from those references, even further considering Musa. Musa discloses a compound that contains an urethane bond between an oxetane group and a styrene group. Musa further discloses that the compound can be produced by a reaction between 3-isopropenyl- α,α -dimethyl-benzyl isocyanate (m-TMI) and 3-ethyl-3-hydroxymethyl-oxetane. However, Musa fails to disclose the isocyanate compound containing (meth)acryloyl group represented by Formula (5) recited in the present claims, let alone that m-TMI can be substituted with the isocyanate compound containing a (meth)acryloyl group as

recited in the present claims. Therefore, the combination of Moszner with Musa fails to render obvious the present invention.

2. The Rejection of Claims 5-6 under 35 U.S.C. § 103 over Mikito

On page 3 of the Office Action, claims 5-6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 11246541 to Mikito et al. (English abstract) (“Mikito”).

In response, Appellant notes initially that the rejection is improper, in that the disclosure of reacting any oxetane with any isocyanate, and in particular, one that does not have the same structure as presently claimed, does not render obvious the claimed method for making the recited oxetane compound.

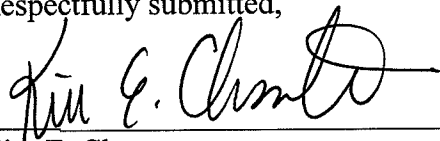
Specifically, Mikito fails to teach, suggest, or render obvious by any other means, the method of producing an oxetane compound as presently claimed, where there is only one oxetanyl group (i.e. $(n) = 1$). Rather, Mikito requires more than one oxetanyl group, e.g., $(n) = 2$ or 3. As such, Mikito fails to disclose or suggest an isocyanate compound containing a (meth)acryloyl group, as presently claimed. As such, the presently claimed invention is not rendered obvious from the disclosure of Mikito.

In consideration of the above, Appellant does not agree with the Examiner's position that Moszner, Hiwara, Musa or Mikito affect the patentability of the present invention. Accordingly, reversal of the rejection of claims 1-4 and 5-6 is respectfully requested.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
Attorney Docket No.: Q79896

The USPTO is directed and authorized to charge the statutory fee (37 C.F.R. §41.37(a) and 1.17(c)), and all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Kim E. Choate", is written over a horizontal line.

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Registration No. 57,102

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23373

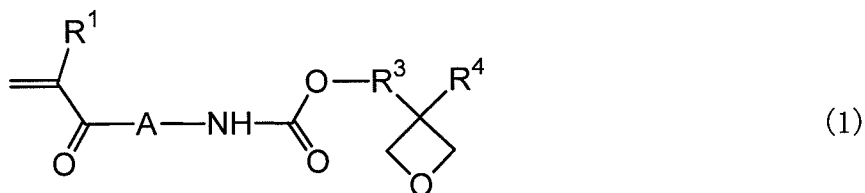
CUSTOMER NUMBER

Date: June 8, 2009

CLAIMS APPENDIX

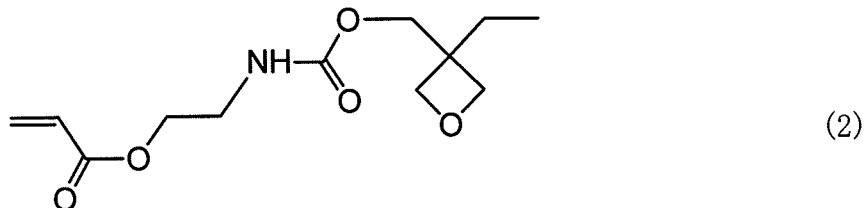
CLAIMS 1-6 ON APPEAL:

1. (original): An oxetane compound containing a (meth)acryloyl group, which is represented by formula (1) below

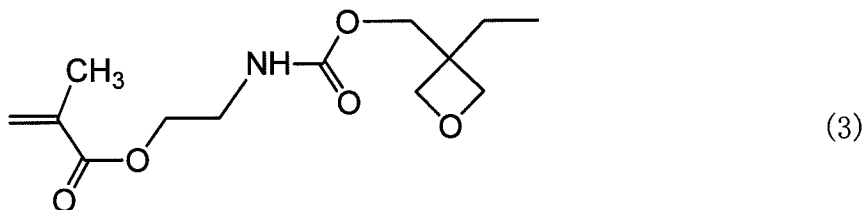


wherein R^1 represents a hydrogen atom or a methyl group, A represents $-OR^2-$ or a bond, R^2 represents a divalent hydrocarbon group which may contain an oxygen atom in the main chain, R^3 represents a linear or branched alkylene group having 1 to 6 carbon atoms, and R^4 represents a linear or branched alkyl group having 1 to 6 carbon atoms.

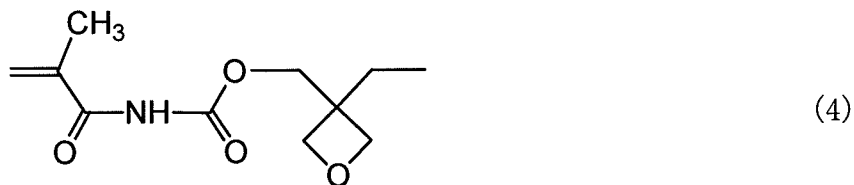
2. (previously presented): The oxetane compound containing a (meth)acryloyl group claimed in claim 1, which is a compound represented by formula (2) below



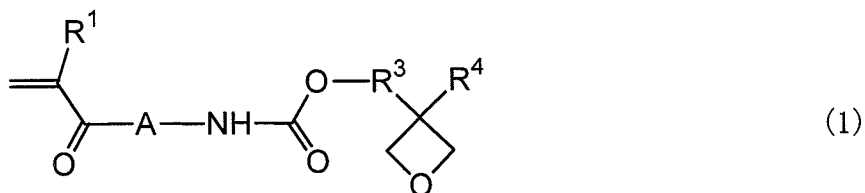
3. (previously presented): The oxetane compound containing a (meth)acryloyl group as claimed in claim 1, which is a compound represented by formula (3) below



4. (previously presented): The oxetane compound containing a (meth)acryloyl group as claimed in claim 1, which is a compound represented by formula (4) below



5. (previously presented): A production method of a compound represented by formula (1) below

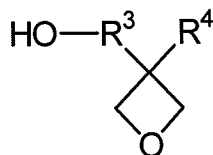


wherein R^1 represents a hydrogen atom or a methyl group, A represents $-OR^2-$ or a bond, R^2 represents a divalent hydrocarbon group which may contain an oxygen atom in the main chain, R^3 represents a linear or branched alkylene group having 1 to 6 carbon atoms, and R^4 represents a linear or branched alkyl group having 1 to 6 carbon atoms,

wherein an isocyanate compound containing a (meth)acryloyl group represented by formula (5) below is reacted with an oxetane compound containing a hydroxyl group represented by formula (6) below



wherein R^1 represents a hydrogen atom or a methyl group, A represents $-OR^2-$ or a bond, and R^2 represents a divalent hydrocarbon group which may contain an oxygen atom in the main chain,



(6)

wherein R³ represents a linear or branched alkylene group having 1 to 6 carbon atoms,
and R⁴ represents a linear or branched alkyl group having 1 to 6 carbon atoms,

where the molar ratio of the isocyanate to oxetane at the time of reaction is 1:0.90 to
1:1.10.

6. (original): The production method of an oxetane compound containing a
(meth)acryloyl group as claimed in claim 5, wherein a tertiary amine or a tin compound is used
as catalyst.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
Attorney Docket No.: Q79896

EVIDENCE APPENDIX:

There are no documents to list either pursuant to 37 C.F.R. § 41.37(c)(1)(ix), or pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132, or any other evidence entered by the Examiner and relied upon by Appellant in the appeal.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No. 10/588,072
Attorney Docket No.: Q79896

RELATED PROCEEDINGS APPENDIX

As set forth above in Section II, there are no decisions rendered by a court or the Board in any proceeding pursuant to 37 C.F.R. § 41.37(c)(1)(ii).